



January 1993

# Patenting Computer Programs: Pragmatic Aspects

Albert J. Dalhuisen

Follow this and additional works at: <http://digitalcommons.law.scu.edu/chtlj>



Part of the [Law Commons](#)

### Recommended Citation

Albert J. Dalhuisen, *Patenting Computer Programs: Pragmatic Aspects*, 9 SANTA CLARA HIGH TECH. L.J. 503 (1993).  
Available at: <http://digitalcommons.law.scu.edu/chtlj/vol9/iss2/5>

This Article is brought to you for free and open access by the Journals at Santa Clara Law Digital Commons. It has been accepted for inclusion in Santa Clara High Technology Law Journal by an authorized administrator of Santa Clara Law Digital Commons. For more information, please contact [sculawlibrarian@gmail.com](mailto:sculawlibrarian@gmail.com).

# PATENTING COMPUTER PROGRAMS: PRAGMATIC ASPECTS

Albert J. Dalhuisen†

## TABLE OF CONTENTS

I. INTRODUCTION .....	504
II. PATENT PROTECTION .....	505
A. <i>Patents in General</i> .....	505
B. <i>Patentability Problems Involving Programs</i> .....	505
III. CLAIM REJECTION AND THE APPEALS PROCESS .....	506
IV. PTO CRITERIA FOR ALLOWANCE OF PROGRAM	
CLAIMS .....	507
A. <i>Definitions</i> .....	508
B. <i>Statutory Nature of Computer Programs</i> .....	508
C. <i>Mathematical Algorithms</i> .....	509
D. <i>Interpretation of In re Iwahashi</i> .....	510
E. <i>In re Iwahashi and In re Grams Distinguished</i> ...	511
V. PTO CLASSIFICATION SYSTEM .....	512
A. <i>Classification System in General</i> .....	512
B. <i>Search Techniques</i> .....	512
C. <i>Classification of Program Patents</i> .....	513
1. <i>Search Techniques and Data Base</i> .....	513
2. <i>Keyword Search</i> .....	514
3. <i>Classification Search</i> .....	515
VI. ANALYSIS OF PROGRAM PATENTS .....	516
A. <i>Proposed Scheme for Analysis</i> .....	516
1. <i>Program-related Claim</i> .....	517
2. <i>De Facto Program Claim</i> .....	517
3. <i>Program Per Se Claim</i> .....	518
4. <i>Program Subject Matter Test</i> .....	518
B. <i>Analysis Results</i> .....	519

---

Copyright © 1993 by Albert J. Dalhausen.

† J.D. 1992, Golden Gate University School of Law; B.S. 1965, Concordia University, Montreal, Canada; member of the California Bar; licensed to practice before the U.S. Patent and Trademark Office. The author wishes to thank the following people for their thoughtful comments and suggestions: Professor Howard C. Anawalt, Santa Clara University School of Law, Santa Clara, California; Laura Terlizzi, Esq., Skjerven, Morrill, MacPherson, Franklin & Friel, San Jose, California; Ronald L. Yin, Esq., Limbach & Limbach, San Jose, California.

VII. CERTAINTIES AND UNCERTAINTIES .....	521
A. <i>Certainties</i> .....	521
B. <i>Uncertainties</i> .....	521
VIII. PATENTABILITY COMPARISONS BETWEEN PROGRAMS AND DNA .....	522
A. <i>Statutory Subject Matter Concerns</i> .....	522
B. <i>Novelty and Non-Obviousness Concerns</i> .....	522
IX. CONCLUSION .....	523
APPENDIX .....	524

## I. INTRODUCTION

In 1992, the Patent and Trademark Office (PTO) granted a total of 487 patents which contained the terms "software" or "computer program" in either the patent title or the patent abstract.<sup>1</sup> While a computer program (program) is clearly an important subject for patents, there remain uncertainties regarding the patentability criteria of claims involving programs. This article illustrates the statutory subject matter requirements for PTO allowance of a claim implementing a program.

A patent may be obtained for "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof . . . ." <sup>2</sup> Subject matter not meeting this definition is nonstatutory and thus not eligible for patent protection.<sup>3</sup> Since a program is not a process, machine or manufacture in the conventional patent sense, it is not always clear under which conditions a program meets the statutory subject matter requirement. Judicial decisions during the past twenty years have resolved many of the issues, particularly those involving mathematical algorithms,<sup>4</sup> methods of doing business<sup>5</sup> and the mental steps doctrine.<sup>6</sup> However, there remains uncertainty, as illustrated by the 1989 reversal by the Federal Circuit of a PTO rejection of a claim including

---

1. The results of the author's keyword search using the PTO's computerized patent search system is described *infra*, Part V, at B.

2. 35 U.S.C. § 101 (1988).

3. See *Diamond v. Diehr*, 450 U.S. 175, 182 (1981).

4. A mathematical algorithm per se is not patentable because it is nonstatutory subject matter. *In re Grams*, 888 F.2d 835, 837 (Fed. Cir. 1989).

5. A method of doing business per se is nonstatutory subject matter, while "a method of operation on a computer to effectuate a business activity" is statutory subject matter. *Paine, Webber, Jackson & Curtis, Inc. v. Merrill Lynch, Pierce, Fenner & Smith, Inc.*, 564 F. Supp. 1358, 1369 (D. Del. 1989).

6. Mental steps requiring computer implementation are statutory subject matter. *In re Bernhardt*, 417 F.2d 1395, 1401 (C.C.P.A. 1969).

a mathematical algorithm program.<sup>7</sup> The reversal has resulted in a split between the Federal Circuit and the PTO regarding the use of the specification to limit the scope of a "means-plus-function" claim involving a program.<sup>8</sup>

The emphasis in this article is on (1) understanding the PTO classification system as used for programs; (2) analyzing what makes a program claim allowable; (3) developing guidance to assist in drafting program claims; and (4) determining program patentability certainties and uncertainties.

## II. PATENT PROTECTION

### A. *Patents in General*

The U.S. Constitution provides for patent rights in Article I, section 8, clause 8: "The Congress shall have Power To . . . ; promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."

In 1952, Congress enacted the Patent Act which is codified in title 35 of the U.S. Code. This Act grants the inventor "for the term of seventeen years, . . . the right to exclude others from making, using, or selling the invention."<sup>9</sup> The Commissioner of Patents and Trademarks is charged with "all duties required by law respecting the granting and issuing of patents."<sup>10</sup> Patent regulations are contained in title 37, Part I of the Code of Federal Regulations. PTO procedures for the examination of patent applications are detailed in the Manual of Patent Examining Procedure (MPEP). In order to obtain patent protection, the applicant must submit a patent application which fully discloses and claims the invention.<sup>11</sup> To be patentable, the invention must meet the utility and subject matter requirements,<sup>12</sup> be novel,<sup>13</sup> and be non-obvious.<sup>14</sup>

### B. *Patentability Problems Involving Programs*

The utility, novelty and non-obviousness requirements are all troublesome for patent applications relating to programs. The U.S.

---

7. See *infra* Part IV, at D.

8. *Id.*

9. 35 U.S.C. § 154 (1988).

10. 35 U.S.C. § 6(a) (1988).

11. 35 U.S.C. § 112 (1988).

12. 35 U.S.C. § 101 (1988).

13. 35 U.S.C. § 102 (1988).

14. 35 U.S.C. § 103 (1988).

Office of Technology Assessment has concluded that the lack of availability of prior art and the use of secrecy to protect commercially available computer programs make it difficult to determine if an application meets the novelty and non-obviousness standards.<sup>15</sup>

The most difficult issue for program patentability concerns the utility requirement under title 35, section 101 of the U.S. Code, in which subject matter may be patented only if it is one of the enumerated statutory classes of "process, machine, manufacture, or composition of matter."<sup>16</sup> Any claim which consists of nonstatutory subject matter is unpatentable. A program is eligible for patent protection under section 101 as a process.<sup>17</sup> However, the courts have found certain types of programs to be statutory while others have been nonstatutory. Some programs appear to be in the uncertain "gray area" between statutory and nonstatutory. The uncertainty continues to be a topic of study and debate.<sup>18</sup>

### III. CLAIM REJECTION AND THE APPEALS PROCESS

A patent is granted only if the patent application is allowed by the examiner, or the examiner's rejection is reversed at one of the subsequent levels of appeal. Following a rejection, the applicant has the option to pursue appeals in the following sequence:<sup>19</sup>

- (i) appeal to the PTO Board of Patent Appeals and Interferences (Board);<sup>20</sup>
- (ii) request reconsideration by the Board;<sup>21</sup>
- (iii) appeal to the Federal Circuit,<sup>22</sup> or file a civil action in the U.S. District Court for the District of Columbia,<sup>23</sup> followed by an appeal to the Federal Circuit;

---

15. Mark F. Radcliffe, *The Future of Computer Law: Ten Challenges for the Next Decade*, *The Computer Lawyer*, Aug. 1991, at 5 (citing OFFICE OF TECHNOLOGY ASSESSMENT, COMPUTER SOFTWARE AND INTELLECTUAL PROPERTY BACKGROUND PAPER 17, at 19 (1990)).

16. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 483 (1974).

17. *Diamond v. Diehr*, 450 U.S. 175, 182 (1981); *Gottschalk v. Benson*, 409 U.S. 63, 64 (1972).

18. 1 RICHARD L. BERNACCHI, ET AL., *BERNACCHI ON COMPUTER LAW* §§ 3.7.1-7.2 (Nov. 1992); 1 DONALD S. CHISUM, *PATENTS* § 1.03[6] (1993); 3 ERNEST B. LIPSCOMB III, *WALKER ON PATENTS* § 11:13 (2d ed. 1985 & Supp. Oct. 1992); Richard H. Stern, *Tales from the Algorithm War: Benson to Iwahashi*, 18 *AIPLA Q.J.* 371 (1991); Michael P. Fleming, *Patentability of Claims Involving Mathematical Algorithms and Computer Programs: An Examiner's Perspective* (Nov. 15, 1991) (unpublished manuscript, on file with the *Santa Clara Computer and High Technology Journal*).

19. 4 *PATENT PRACTICE* 15-48 (PRI 1989).

20. 37 *CFR* § 1.191(a) (1992).

21. 37 *CFR* § 1.197(b) (1992).

22. 35 *U.S.C.* § 141 (1988).

23. 35 *U.S.C.* § 145 (1988).

- (iv) file a writ of certiorari;<sup>24</sup> and
- (v) appear before the U.S. Supreme Court.

The prosecution histories of five important program patents which were allowed following appeals to the Federal Circuit or its predecessor court, the Court of Customs and Patent Appeals (C.C.P.A.), revealed that the appeals process causes a delay of several years in the issuance of a patent.<sup>25</sup> Currently, the delay due to appeals in cases involving computer program technology, following rejection by the examiner, is estimated at several years.<sup>26</sup> In fast changing technologies such as computer programs, the long delay makes the appeals route unattractive to many inventors and assignees. While the delay effectively adds time to the seventeen year term of patent protection, it has the serious disadvantage of adding uncertainty as to whether a patent will ultimately be granted and increasing the cost of obtaining a patent. It is thus vitally important to obtain patent allowance by the examiner. The split between the PTO and the Federal Circuit regarding the interpretation of claim scope in certain "means-plus-function" types of claims<sup>27</sup> also increases the desirability of obtaining patent allowance from the examiner rather than resorting to an appeal.

#### IV. PTO CRITERIA FOR ALLOWANCE OF PROGRAM CLAIMS

The PTO has published procedures, policies and guidelines concerning allowable computer program subject matter.<sup>28</sup> The guidelines are based on a detailed interpretation of all significant court decisions relating to the statutory subject matter of computer programs and algorithms, ending with *In re Iwahashi*.<sup>29</sup> A recent paper by a PTO Supervisory Patent Examiner is entirely consistent with the published PTO guidelines.<sup>30</sup>

A summary of the PTO guidelines follows.

---

24. 28 U.S.C. § 2101 (1992).

25. See Appendix.

26. Letter from Ronald L. Yin, Patent Attorney, Limbach & Limbach, to Albert J. Dalhuisen (Apr. 29, 1992) (on file with the *Santa Clara Computer and High Technology Law Journal*).

27. See *infra* Part IV, at D.

28. PATENT AND TRADEMARK OFFICE, U.S. DEP'T OF COMMERCE, MANUAL OF PATENT EXAMINING PROCEDURE §§ 2106-2106.02 (5th ed. rev. Oct. 1989) [hereinafter MPEP]; James E. Denny, *Notice Interpreting In Re Iwahashi*, 1112 Off. Gaz. Pat. Office 16-17 (Mar. 13, 1990); Fred E. McKelvey, *Patentable Subject Matter*, 1106 Off. Gaz. Pat. Office 5-12 (Sept. 5, 1989).

29. 888 F.2d 1370 (Fed. Cir. 1989).

30. Fleming, *supra* note 18.

### A. Definitions

- Computer programs, computer processes and software are equivalent, referring to "both the series of steps performed by a computer, and the software directing those steps."<sup>31</sup>

- A mathematical algorithm is distinguished from an algorithm. A mathematical algorithm is "a procedure for solving a given type of mathematical problem."<sup>32</sup> An algorithm is "a step-by-step procedure to arrive at a given result."<sup>33</sup>

- "No distinction is made between mathematical algorithms invented by man, and mathematical algorithms representing discoveries of scientific principles and laws of nature which reveal a relationship that has always existed."<sup>34</sup>

### B. Statutory Nature of Computer Programs

The guidelines strongly infer that the PTO considers computer programs statutory subject matter unless they fall within a judicially determined exception (e.g., mathematical algorithm programs). The PTO has made the following statements concerning programs:

- "[T]he Supreme Court has not ruled on the patentability of computer programs;"<sup>35</sup>
- "[the Court of Customs and Patent Appeals] has held that computer processes are statutory unless they fall within a judicially determined exception;"<sup>36</sup>
- "[t]he major (and perhaps only) exception in the area of computer processes is the mathematical algorithm;"<sup>37</sup>
- "[i]f a computer process claim does not contain a mathematical algorithm in the Benson sense, the second step of the *Freeman-Walter-Abele* test<sup>38</sup> is not reached and the claimed subject matter will usually be statutory;"<sup>39</sup>
- "[t]he C.C.P.A. [has] . . . held that a computer algorithm, as opposed to a mathematical algorithm, is patentable subject mat-

---

31. McKelvey, *supra* note 28, at 11-12 (citing *Gottschalk v. Benson*, 409 U.S. 63, 65 (1972)).

32. McKelvey, *supra* note 28, at 6 (citing *Diamond v. Diehr*, 450 U.S. 175, 186 (1981); *Parker v. Flook*, 437 U.S. 584, 585 n.1 (1978); and *Gottschalk v. Benson*, 409 U.S. 63, 65 (1972)).

33. McKelvey, *supra* note 28.

34. *Id.* at 6.

35. *Id.* at 11.

36. *Id.*

37. *Id.*

38. Also note explanation *infra* Part IV, section C.

39. McKelvey, *supra* note 28, at 11.

ter,"<sup>40</sup> and

- "laws of nature, physical phenomena and abstract ideas" are considered nonstatutory subject matter.<sup>41</sup> "Mathematical algorithms are nonstatutory because they have been determined not to fall within the section 101 statutory class of a process."<sup>42</sup> Also, "'while a method of doing business' per se is non-statutory subject matter, 'a method of operation on a computer to effectuate a business activity' has been held to be statutory subject matter."<sup>43</sup>

### C. *Mathematical Algorithms*

Even though a mathematical algorithm per se is unpatentable, it does not necessarily mean that any patent claim containing a mathematical algorithm is therefore unpatentable. Whether or not a claim is eligible for patent protection depends on a determination of the patentability of the claim as a whole.<sup>44</sup> A distinction is drawn between inventions claiming a mathematical algorithm per se, and inventions which claim an application of the algorithm. Claiming a mathematical algorithm is analogous to claiming the application of a law of nature,<sup>45</sup> and as such, is patentable subject matter under section 101.<sup>46</sup> The PTO and the courts use the two-part *Freeman-Walter-Abele* test to ascertain whether a claim containing a mathematical algorithm meets the section 101 requirement for statutory subject matter.<sup>47</sup> The first part of the test determines whether the claim directly or indirectly recites a mathematical algorithm.<sup>48</sup> If it does not, the program will usually be statutory. If it recites a mathematical algorithm, the PTO (and the courts) then employ the second part of the test. In the second part, the claim will pass muster under section 101 only if the mathematical algorithm is applied in any manner to physical elements or process steps.<sup>49</sup> Some examples of algorithm applications which are deemed insufficient to meet the section 101 requirements are: nonessential post solution activity of the program (e.g. printing the result), field of use limitations

---

40. *Id.*

41. *Id.* at 6 (citing *Diamond v. Diehr*, 450 U.S. 175, 185 (1981)).

42. *Id.* at 6 (citing *Gottschalk v. Benson*, 409 U.S. 63, 65 (1972)).

43. *Id.* at 11 (citing *Paine, Webber v. Merrill Lynch*, 564 F. Supp. 1358, 1369 (D. Del. 1983)).

44. *Diamond v. Diehr*, 450 U.S. 175, 188 (1981).

45. *Parker v. Flook*, 437 U.S. 584, 589-90 (1978).

46. *In re Abele*, 684 F.2d 902, 907 (C.C.P.A. 1982).

47. *In re Abele*, 684 F.2d at 905; McKelvey, *supra* note 28, at 6-10.

48. *In re Abele*, 684 F.2d at 905.

49. *Id.*



of the mathematical algorithm, data gathering steps interacting with the algorithm, and physical transformations which are mere manipulations of data. Court decisions provide guidance in judging whether the manner in which a mathematical algorithm is applied results in statutory subject matter.<sup>50</sup> However, predictability regarding allowance of claims reciting a mathematical algorithm remains uncertain because the criteria are not clearly defined.<sup>51</sup>

The first step in the two part test requires a determination as to whether the claim recites a mathematical algorithm. In *Ex parte Logan*,<sup>52</sup> the Board provided the following test for a mathematical algorithm:

[W]e believe a claim should be considered as reciting a mathematical algorithm only if it essentially recites, directly or indirectly, *a method of computing one or more numbers from a different set of numbers by a series of mathematical equations*. Consequently, a claim which essentially recites another type of method does not recite a mathematical algorithm, even though it incidentally requires, either directly or indirectly, the performance of some mathematical computations.<sup>53</sup>

*Logan* passed muster under section 101 because the computations are "essentially directed to detecting the occurrence of events . . . by determining when a time-varying respiration signal crosses an adjustable trigger level," rather than "computations to [compute] one or more numbers from a different set of numbers."<sup>54</sup>

#### D. Interpretation of *In re Iwahashi*

In *In re Iwahashi*,<sup>55</sup> the Federal Circuit reversed the PTO's rejection of a claim reciting a mathematical algorithm. The PTO agreed with the court's decision finding it to be "consistent with precedent and PTO policy"<sup>56</sup> since a read-only memory (ROM) is used in implementing the algorithm.<sup>57</sup> The ROM satisfies the second test of the *Freeman-Walter-Abele* test.<sup>58</sup> As a result, the claim as a whole satisfies the section 101 requirement.<sup>59</sup> This case re-

---

50. Fleming, *supra* note 18, at AD 9-14.

51. *Id.* at AD 9.

52. 20 U.S.P.Q.2d 1465 (1991).

53. *Id.* at 1468 (emphasis added).

54. *Id.*

55. 888 F.2d 1370 (Fed. Cir. 1989).

56. Denny, *supra* note 28, at 16.

57. *Id.*

58. *Id.*

59. *Id.*

vealed an important split between the Federal Circuit and the PTO regarding claim scope interpretation. The *Iwahashi* court in dicta stated that a "means-plus-function" limitation can be read into the claim from the specification even if this is not recited in the claim.<sup>60</sup> It is the PTO's position that the scope of a claim for a section 101 determination should be interpreted as broadly as possible from the recitation in the claim without reference to the specification.<sup>61</sup> The disagreement between the Federal Circuit and the PTO is likely to add to the uncertainty in predicting whether a claim containing a mathematical algorithm will be allowed under section 101.

#### E. *In re Iwahashi* and *In re Grams* Distinguished

Both *In re Iwahashi* and *In re Grams*<sup>62</sup> involve a claim reciting a mathematical algorithm. The *Grams* claim was rejected by the Federal Circuit for failure to meet the statutory subject matter requirement.<sup>63</sup> One week later, the same court allowed the *Iwahashi* claim.<sup>64</sup> *Grams* is not mentioned in the PTO guidelines. The PTO position can be inferred from PTO Supervisory Patent Examiner Fleming's paper.<sup>65</sup> In that paper, *Grams* is used as an example of a claim in which the only limitation of the mathematical algorithm is in the data gathering steps.<sup>66</sup> Apart from the text of claim 1, Fleming cites only one sentence from the opinion: "The presence of a physical step in the claim to derive data for the algorithm will not render the claim statutory."<sup>67</sup> The PTO concludes that *Iwahashi* is allowable because the mathematical algorithm is applied to a physical element (the ROM) in the claim. In *Grams*, the physical element is used in the data gathering step to which the mathematical algorithm is applied.<sup>68</sup> Fleming's analysis suggests that the PTO would reject the *Grams* claim for failing to satisfy the second step of the *Freeman-Walter-Abele* test, since the physical element is used only in the data gathering step.

The author considers it significant that Fleming does not cite other important language from *Grams* (i.e., "The specification does not bulge with disclosure on these tests. To the contrary it focuses

---

60. *In re Iwahashi*, 888 F.2d 1370, 1375 n.1 (Fed. Cir. 1989).

61. Denny, *supra* note 28, at 17.

62. 888 F.2d 835 (Fed. Cir. 1989).

63. *Id.* at 841.

64. *In re Iwahashi*, 888 F.2d at 1375.

65. Fleming, *supra* note 18.

66. *Id.* at AD 11-12 (quoting *Grams*, 888 F.2d at 836-37).

67. *Id.* at AD 12 (quoting *Grams*, 888 F.2d at 840).

68. *In re Grams*, 888 F.2d at 839.

on the algorithm itself, although it briefly refers to, without describing, the clinical tests that provide data.”<sup>69</sup>). Since the applicant claimed that “the invention is applicable to any complex system,” the court concluded that the mathematical algorithm itself was claimed.<sup>70</sup> The Federal Circuit appears to leave the door open to allow a *Grams* type of claim if the applicant provides copious test data and limits the use of the algorithm to a specific narrow application area, *e.g.*, clinical testing. The PTO, however, would probably not inquire into the adequacy of the data or the limited use, but would reject the claim because the physical element is present only in the data gathering step.

## V. PTO CLASSIFICATION SYSTEM

### A. *Classification System in General*

The primary purpose of the classification system is to provide for patentability searches by patent examiners.<sup>71</sup> Statutory authority for the classification system is provided in title 35, section 9 of the U.S. Code. Classification is the basic method used to describe a patent’s subject matter. It provides one of the most important search tools for the PTO, the inventor and the patent practitioner. The classification system derives much of its utility from the PTO’s extensive use of cross-reference classifications. This is particularly true for programs.

The PTO assigns each new patent an original classification and usually one or more cross-reference classifications. The patent’s original classification identifies the claimed subject matter on the basis of its industry or use, function, effect or product, or structural features. Cross-reference classifications may identify the patent’s other claimed subject matter and may be used to describe unclaimed art or technology which is disclosed but not claimed. Each of the more than three hundred classes is divided into subclasses to narrow the scope of the subject matter. The number of subclasses within a class ranges from a few to hundreds.

### B. *Search Techniques*

As a first step in a search, the searcher can locate the main classes of interest through the alphabetical listings of common and technical terms in the *Index to the U.S. Patent Classification Sys-*

---

69. *Id.* at 840.

70. *Id.*

71. MPEP § 903.02 (rev. Nov. 14, 1992).

tem.<sup>72</sup> Next, the *Manual of Classification* is used to further define the search classes.<sup>73</sup> The manual lists all subclasses for each main class in an ordered arrangement of titles. Once the most likely class/subclasses are identified, the proper field of search is obtained by using the definitions of these classes. The PTO provides extensive information and documentation on the classification system and its use in searching.<sup>74</sup> The PTO Classification and Search Support Information System (CASSIS) is available on CD-ROM for use with a personal computer. CASSIS is essentially a computerized version of the various manual search techniques. It also provides for keyword searches. CASSIS can be used to: (i) define a field of search; (ii) search patents by words in their titles or abstracts; (iii) search and display definitions of all classes and subclasses; (iv) combine keyword searches with class searches; (v) find current classifications of recent patents; (vi) find patents assigned to a company; (vii) search patents by date, status, inventor's residence; (viii) find all patents issued to an inventor; and (ix) display individual chapters of the MPEP.

CASSIS provides options to search and print by patent number, title, classification, date, inventor, assignee and abstract. However, it is limited in the sense that the text of the specification and the claims cannot be searched. Nonetheless, it is a good preliminary screening tool for retrieving most of the relevant patents. One of the most straightforward CASSIS or manual search techniques is a search of the classifications of patents which the searcher knows are relevant to the particular field of search.

### C. *Classification of Program Patents*

#### 1. Search Techniques and Database

A patent search was conducted for patents issued from April 3, 1990 through May 27, 1991. The 131,234 patents granted during this period form the database for a keyword search of the abstracts and titles. The April 3, 1990 date was chosen because the PTO's most recent policy regarding patentability of program claims was published on March 13, 1990.<sup>75</sup> Various manual, microfilm and

---

72. U.S. DEP'T OF COMMERCE, INDEX TO THE U.S. PATENT CLASSIFICATION SYSTEM (Dec. 1992).

73. U.S. DEP'T OF COMMERCE, MANUAL OF CLASSIFICATION.

74. U.S. DEP'T OF COMMERCE, HANDBOOK ON THE USE OF THE U.S. PATENT CLASSIFICATION SYSTEM FOR PATENT DEPOSITORY LIBRARIES (Sept. 1988).

75. Denny, *supra* note 28.

computer-assisted search techniques were used, relying primarily on CASSIS.<sup>76</sup>

## 2. Keyword Search

Keyword searches of patent abstracts and titles were conducted in order to use the applicant's description of the patent, and to correlate this with the classification issued by the PTO. Classification searches were utilized to determine the examiner's characterization of the claimed invention. The CASSIS keyword search "SOFTWARE" OR "COMPUTER PROGRAM\*" produced the desired dragnet effect of identifying patents in a great variety of program contexts. The broad search of the sample period resulted in a total of 596 patents.<sup>78</sup> The results include patents in which the program is the main element of the claimed subject matter as well as those in which the program is not part of the actual invention (*e.g.*, a cardboard package designed for software storage<sup>79</sup>). This particular search is unsuitable for identifying patents in which a program is an element of a claim since the results are both over-inclusive as well as under-inclusive. It is over-inclusive because it includes many patents where a program is not an element of a claim. It is under-inclusive because it does not identify program patents which do not have the word "program" or "software" in either the abstract or the title. A keyword search of abstracts is much more effective when the keywords have a narrow meaning (*e.g.*, "ARTIFICIAL INTELLIGENCE PROGRAM") or when the keyword search is executed within a specific classification. The PTO and patent practitioners use the terms "SOFTWARE" and "COMPUTER PROGRAMS" synonymously. However, a key-word search for the one term does not identify patents or classifications in which the other term is used. To retrieve all references relating to programs, both terms must be used connected with an "OR" operator. Truncation as "PROGRAM\*" is essential to retrieve all references relating to "program," "programs," "programmable," "programmed," or "programming."

---

76. The author conducted the research at the Sunnyvale Patent Information Clearinghouse, PTO Patent Depository Library, Sunnyvale, California.

77. The "\*" represents a wildcard character.

78. Search of CASSIS, Sunnyvale Patent Information Clearinghouse, Sunnyvale, California (Apr. 2, 1993)(search of BIBLIOGRAPHIC INFORMATION file for records containing "SOFTWARE" or "COMPUTER PROGRAM\*" in TITLE OR ABSTRACT field).

79. One-piece, self-locking computer software container, U.S. Patent No. 5,012,930, Hansen, inventor (May 7, 1991).

### 3. Classification Search

The "SOFTWARE" OR "COMPUTER PROGRAM\*" keyword search resulted in patents classified under more than three hundred different class/subclass designations, indicating the use of programs in a wide variety of patented inventions. The great majority of program-related patents are classified under class numbers 364<sup>80</sup> or 395.<sup>81</sup> Class 364/300, which was specifically for "computer programs per se," was abolished in August 1990. Patents which were originally classified under 364/300 are now reclassified under a variety of 364 or 395 subclasses. The classification system is a dynamic system. New classes are formed and existing classes are re-defined to accommodate developments in technology. In recent years there have been several extensive revisions of classifications relating to programs.<sup>82</sup> A classification revision is followed by a reclassification of all patents which are affected by the change.<sup>83</sup> Searchers need to be alert to these changes because the text of a printed patent does not reflect reclassification. Conducting a search in reliance on the classification printed on the patent may lead to the wrong search results. Patent reclassifications are updated in CASSIS and the PTO's classification cross reference system on microfilm.

A computer program may be classified according to its function or its interaction with other components. Examples are as follows:

- i. The function of the program: class/subclass No. 395/700<sup>84</sup> definition "system utilities: subject matter under the class definition relating to functions performed by an operating system (*i.e.*,

---

80. "Class 364, Electrical computers and data processing systems . . . This is the generic class for electrical apparatus and corresponding data processing operations, in which there is a significant change in the data or for performing calculation operations." Class 364, U.S. DEP'T OF COMMERCE, PATENT CLASSIFICATION DEFINITIONS, 364-1 (June 1992).

81. "Class 395, Information processing system organization . . . This is the generic class for digital processing systems and corresponding methods for performing information processing functions and methods for controlling operations of such processing systems." Class 395, U.S. DEP'T OF COMMERCE, PATENT CLASSIFICATION DEFINITIONS, 395-1 (Dec. 1991).

82. *E.g.*, class 395 was created from class 364 subclasses 200, 513, 513.8, 518-523 and 900. *Id.* at 395-2.

83. *E.g.*, U.S. Patent 4,924,408, Highland, inventor (May 8, 1990), issued under classification 364/513 and subsequently reclassified under 395/50. U.S. DEP'T OF COMMERCE, PATENT CLASSIFICATION DEFINITIONS, 395-22 (Dec. 1991).

84. *See, e.g.*, Customization of a system control program in response to initialization of a computer system, U.S. Patent No. 4,979,106, Schneider, inventor (Dec. 18, 1990).

software for controlling computer operation)."<sup>85</sup>

ii. The physical object or procedure with which the program interacts: class/subclass No. 360/60<sup>86</sup> definition "subject matter under subclass 55 including sensing or indicating the existence of an earlier recording on a record carrier and preventing erasure or double exposure of the carrier."<sup>87</sup>

The classification system is capable of identifying a specific type of program, or specific use of a program, if the searcher uses a four stage search:

1. Start with a keyword search of the classification definitions;
2. Conduct patent searches within the classifications which were identified through the definitions search;
3. Select patents which are relevant to the field of search;
4. Search the original classifications of the patents which are selected in the third stage.<sup>88</sup>

The primary focus was on program classifications where the program itself is claimed without interaction with other components in the system, since section 101 problems are most likely to arise in this context. These classifications were identified through a two-stage search. The first stage consisted of a keyword search of the classification definitions to identify all classes in which a program is part of the definition. These classifications were reviewed to select classifications which are most likely to include a program claim per se. That is a claim wherein the program itself is claimed as the embodiment of a particular computer process.<sup>89</sup> Patents issued under classifications defining a program per se were examined to determine which types of program claims are allowed.<sup>90</sup>

## VI. ANALYSIS OF PROGRAM PATENTS

### A. *Proposed Scheme for Analysis*

The author proposes an analytical technique for examining

---

85. Class 395, U.S. DEP'T OF COMMERCE, PATENT CLASSIFICATION DEFINITIONS, 395-22 (Dec. 1991).

86. See, e.g., Software protection and identification system, U.S. Patent No. 4,980,782, Ginkel, inventor (Dec. 25, 1990).

87. Class 360, U.S. DEP'T OF COMMERCE, PATENT CLASSIFICATION DEFINITIONS, 360-11 (Dec. 1991).

88. Caveat: a search is likely to lead to incomplete or erroneous results if the searcher limits the search to only a few classifications when still in one of the early stages.

89. E.g., the definition of subclass No. 395/600 "Database or file management system: Subject matter under the class definition relating to the addressing, retrieval or manipulation of information contained within the database of a digital processing system." Class 395, U.S. DEP'T OF COMMERCE, PATENT CLASSIFICATION DEFINITIONS, 395-21 - 395-22 (Dec. 1991).

90. See *infra* Part V, at C.

program claims to aid in understanding what is deemed allowable by the PTO. In addition, this technique might be useful for drafting program claims. The scheme is intended to clarify the distinctions between allowable and rejectable program claims under section 101. The following three categories are proposed to define program patents through an analysis of the claims: (i) program-related claim (narrow claim scope); (ii) de facto program claim (intermediate claim scope); and (iii) program per se claim (broad claim scope). An additional separate test is proposed to assess whether the program's subject matter meets the requirements of section 101. In this analysis the claim is considered as a whole, and its scope is defined by the language in the claim without reference to the specification.<sup>91</sup>

### 1. Program-related Claim

A claim is deemed program-related<sup>92</sup> where the program as claimed is applied in any manner to a nontrivial physical element or process step which itself constitutes statutory subject matter under section 101. The following elements or steps are trivial: (i) non-essential post solution activity; (ii) field of use limitations; (iii) data gathering steps; (iv) a physical step which is a mere manipulation of data; (v) merely labeling the data in the memory; and (vi) rewriting a nonstatutory method claim into apparatus format.<sup>93</sup>

### 2. De Facto Program Claim

A claim is deemed a de facto program claim<sup>94</sup> where the program as claimed is applied in any manner to a trivial<sup>95</sup> physical element or process step which itself constitutes statutory subject matter.

---

91. Defining the scope solely by the language in the claim itself is consistent with PTO guidelines and avoids the conflict between the Federal Circuit and the PTO, *see supra* Part IV at D, while not affecting the Federal Circuit criteria for claim allowance expressed in *In re Iwahashi*, 888 F.2d 1370, 1375 n.1 (Fed. Cir. 1989).

92. Examples of program-related claims: U.S. Patent No. 4,344,142, Diehr, inventor (Aug. 10, 1982) in which the program controls and operates a rubber vulcanization press, and U.S. Patent No. 5,007,101, Iwahashi, et al., inventors (Apr. 9, 1991) in which a mathematical algorithm program is applied to a ROM.

93. As used in the "second step" of the *Freeman-Walter-Abele* test, *see supra* Part IV at D, and as interpreted by Fleming, *supra* note 18.

94. *See, e.g.*, U.S. Patent No. 4,398,249, Pardo, et al., inventors (Aug. 9, 1983) where the claimed program converts a source program into an object program. The trivial steps in the claims are the program's interaction with storage areas of the data processor, and the fact that program execution merely results in data.

95. As defined in "Program-Related Claim", *supra* Part VI, at A.1.



### 3. Program Per Se Claim

A claim is deemed a program per se claim<sup>96</sup> where the program is not applied to any physical element or process step, and program execution results merely in data or non-essential post solution activity.

### 4. Program Subject Matter Test

De facto or per se program claims must be analyzed for statutory subject matter. PTO policies and guidelines show that this type of patent claim is unpatentable if it consists of a mathematical algorithm because such a claim fails to meet the *Freeman-Walter-Abele* test. Analysis of the PTO guidelines in total leads to the conclusion that this type of claim is unpatentable if it consists of non-statutory subject matter, not just if it concerns a mathematical algorithm.<sup>97</sup> The following Computer Program Statutory Subject Matter test (CPSSM test), which is consistent with PTO guidelines, is proposed.

Using the CPSSM test, one first determines whether the claim is a program-related, de facto or per se program claim. If the claim is program-related, it is eligible for patent protection under section 101. If the claim is a de facto or per se program claim, it is statu-

---

96. *E.g.*,

A method of converting both a knowledge base and an inferencing technique into compilable program code forming a knowledge based system, said knowledge base including rules on data items, said rules being arranged in a network of nodes and links between such nodes, said nodes representing tests, logical operators, actions and data items, said network being in a form convenient for interpretive inferencing, said method comprising the steps of:

- (a) partitioning said network into a plurality of subnetworks;
- (b) labelling each node within each respective subnetwork with a unique identifier;
- (c) generating a segment of compilable, procedural, program code for inferencing which is equivalent to each respective sub-network when combined with said inferencing technique, said identifiers locating the respective code for each node within each respective sub-network, said inferencing code comprising a node sub-segment that implements the function of each node in said respective sub-network based on the rules specified in said knowledge base and that conditionally invokes other sub-segments using said identifiers, and a control sub-segment which provides access to each node sub-segment using said identifiers and provides for repeated execution of each node sub-segment as necessary; and
- (d) generating for each data item a segment of compilable procedural, program code for the distribution of such data item which invokes the appropriate program inferencing code by means of said identifiers when such data item is modified during execution of the knowledge based system.

U.S. Patent No. 4,924,408, Highland, inventor (May 8, 1990), claim no. 1.

97. *See supra* Part IV, at B.

tory subject matter under section 101, unless the claim falls within a judicially determined exception for statutory subject matter.

At present time, a mathematical algorithm and a method of doing business are the only judicially determined exceptions for program claims in connection with statutory subject matter. It is conceivable that future programs might consist of laws of nature, physical phenomena or abstract ideas which are not mathematical expressions. These types of programs would most likely be deemed unpatentable in de facto or per se claims because they consist of nonstatutory subject matter. The program in a program-related claim need not be examined for statutory subject matter since the claim as a whole is deemed statutory due to the physical element or process with which the program is interacting, by analogy with *Iwahashi*,<sup>98</sup> *Diehr*,<sup>99</sup> and PTO guidelines.<sup>100</sup>

### B. Analysis Results

The most important test categories for the analysis are the de facto and per se program claims. Classifications which were most likely to contain patents with these claims were selected based on the class title and definition.<sup>101</sup> The patents obtained from the CASSIS search<sup>102</sup> were reviewed, and those in the original and cross-referenced classifications (i.e., 364/274.1, 364/474.23, 364/927.82 and 395/700) were selected for further study. A total of 59 patents were selected. These patents were reviewed and subjected to the CPSSM Test. The test results are categorized as follows:

1. program-related claims: 52 patents (including mathematical algorithm patents);
2. de facto program claims: 6 patents;<sup>103</sup> and
3. program per se claims: one patent.<sup>104</sup>

The de facto and per se claims meet the proposed CPSSM Test. The claim in *Grams*,<sup>105</sup> which was rejected by the Federal Circuit and the PTO, is similarly deemed nonstatutory by the test. The

---

98. *In re Iwahashi*, 888 F.2d 1370 (Fed. Cir. 1989).

99. *Diamond v. Diehr*, 450 U.S. 175 (1981).

100. McKelvey, *supra* note 28.

101. See *supra* notes 76-86 and accompanying text.

102. See *supra* note 77 and accompanying text.

103. U.S. Patent Nos. 5,028,923, Seki, et al., inventors (July 2, 1991); 4,961,141, Hopkins, et al., inventors (Oct. 2, 1990); 4,939,635, Seki, et al., inventors (July 3, 1990); 4,931,935, Ohira, et al., inventors (June 5, 1990); 4,916,633, Tychonievich, et al., inventors (Apr. 10, 1990); and 4,914,590, Loatman, et al., inventors (Apr. 3, 1990).

104. U.S. Patent No. 4,924,408, Highland, inventor (May 8, 1990), claim no. 1. See *supra* note 96 for the text of claim no. 1 of this patent.

105. *In re Grams*, 888 F.2d 835, 836-37 (Fed. Cir. 1989).

results indicate that this test provides an effective method to determine claim allowance under section 101. The test was not applied to patents issued or rejections appealed prior to April 3, 1990. The proposed CPSSM test uses the same criteria as the *Freeman-Walter-Abele* test but applies them in a different manner. The first inquiry in the CPSSM test is to determine whether the claim is a program-related, de facto or per se program claim. A review of patents in this database showed that the great majority of patents are in the program-related category. There are relatively few cases where it is difficult to draw a distinction between a program-related and a de facto or a per se program claim. If the claim is program-related, it is deemed statutory subject material regardless of the type of computer program (e.g., a mathematical algorithm). Only in a relatively few de facto or per se program claims is it necessary to determine if the program constitutes statutory subject matter. The first inquiry in the *Freeman-Walter-Abele* test is to ascertain whether the program is a mathematical algorithm. It is difficult to judge whether a program is an algorithm or a mathematical algorithm because the courts have not provided a clear distinction. With the CPSSM test, it is only necessary to differentiate between the two types of algorithms in relatively few instances, thus resulting in fewer doubts regarding statutory subject matter.

When used to aid in drafting claims, the CPSSM test assists in developing a claim strategy with an improved likelihood of drafting allowable claims because the three categories have a different claim scope. The claims in a patent can be drafted in accordance with the three categories. The program should be claimed as a per se program claim in the broadest claims in the patent. Claims of intermediate scope would constitute de facto program claims, while program-related claims have the narrowest claim scope by claiming an interaction between the mathematical algorithm and statutory subject matter. This strategy maximizes the possibility that at least the narrowest claims will pass muster under section 101. Overall, the CPSSM test is a more effective test than the *Freeman-Walter-Abele* test although both are based on the same criteria. The CPSSM test is applicable for use with programs which fall into any judicially determined exception for statutory subject matter while the *Freeman-Walter-Abele* test applies only to mathematical algorithms as judicially determined exceptions.

Another potential use of the analytical technique is the development of a "library" of allowed program claims. Information for this library can be developed by analyzing patents in many of the

classifications which use the terms "software" or "computer program" in the class definitions. Once the claims are categorized as program-related, de facto, or per se, they can be indexed by type of claim (product, process, means-for, *etc.*) and type of program. This can be used by the patent practitioner as an effective guide in program claim drafting, and as a basis for responding to section 101 rejections.

## VII. CERTAINTIES AND UNCERTAINTIES

Court decisions, PTO policies and a review of recent program patents are summarized below.

### A. *Certainties*

1. Computer programs per se are patentable subject matter unless they fall within a judicially determined exception.

2. Judicially determined exceptions for program patents are mathematical algorithms and methods of doing business. Judicially determined exceptions for patentable subject matter in general include ". . . laws of nature, natural phenomena, and abstract ideas"<sup>106</sup> as well as a mathematical formulae.<sup>107</sup>

3. Mathematical algorithm programs per se are nonstatutory subject matter and, thus, unpatentable.

### B. *Uncertainties*

1. The Board has provided a test to determine whether a claim recites a mathematical algorithm, as applied in the *Freeman-Walter-Abele* test. It is not certain whether the courts will adopt the same test.

2. There is no clear dividing line between statutory and non-statutory subject matter for mathematical algorithm program claims.

3. The protective strength of some mathematical algorithm program patents is questionable because others may be able to use the program without infringing the patent.<sup>108</sup>

---

106. *Diamond v. Diehr*, 450 U.S. 175, 185 (1981).

107. *Id.* at 186.

108. Following is a hypothetical example similar to U.S. Patent No. 5,007,101, Iwahashi, et al., inventors (Apr. 9, 1991), to illustrate the vulnerability of some types of computer claims. The claim in a hypothetical patent recites the application of a mathematical algorithm to a ROM for implementing the squaring terms of the algorithm. A third party can use the algorithm without infringing by incorporating the ROM information in the program, thus eliminating the ROM. Removal of the ROM means that the new program is nonstatu-

4. The list of currently enumerated classes of nonstatutory subject matter is probably not all-inclusive. It is likely that this will be subject to further definition as programs find application in even more varied uses.

### VIII. PATENTABILITY COMPARISONS BETWEEN PROGRAMS AND DNA

Both DNA and computer program technologies require new and highly specialized methods for describing and claiming the invention.<sup>109</sup> Although the technologies are very different, there is a similarity in patentability problems, particularly in regard to statutory subject matter issues.

#### A. *Statutory Subject Matter Concerns*

Both DNA in its natural state and a mathematical algorithm are per se unpatentable. Naturally occurring DNA is unpatentable because "manifestations of . . . nature"<sup>110</sup> are nonstatutory subject matter under section 101. A mathematical algorithm is nonstatutory subject matter since the algorithm "is like a law of nature."<sup>111</sup> DNA isolated from its natural state, or manipulated within a cell without isolating it, results in statutory subject matter.<sup>112</sup> DNA is thus statutory subject matter when it is subjected to significant human intervention. Similarly, a mathematical algorithm may meet the section 101 requirements once it is subjected to human invention through interaction between the algorithm and statutory subject matter, *i.e.*, a human-made object (*e.g.*, a ROM).

#### B. *Novelty and Non-obviousness Concerns*

There is no complete catalog of naturally occurring DNA sequences. As a result, it is impossible to determine with certainty nature's prior art. Furthermore, DNA mutates constantly, thus

---

tory subject matter since it is a mathematical algorithm per se. Nonstatutory subject matter is unpatentable and as such incapable of infringing any patent. Program execution with a ROM is usually faster than a program which incorporates the information in the program itself. If high execution speed is essential, the use of a ROM may offer an important advantage (Telephone interview with Ronald L. Yin, Patent Attorney, Limbach & Limbach, San Jose, California (Apr. 22, 1992)). The subject of the Iwahashi patent is speech recognition which is a computer application where high speed is essential.

109. 37 C.F.R. §§ 1.96, 1.821 - 1.825 (1992); MPEP §§ 608.05, 706.03(a), 708.02 (VII), 2106, 2106.01-.02 (rev. Nov. 14, 1992).

110. *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

111. *Diamond v. Diehr*, 450 U.S. 175, 186 (1981).

112. Interview with Lauri Terlizzi, Patent Attorney, Skjerven, Morrill, MacPherson, Franklin & Friel, in San Jose, California (Jan. 13, 1992).

forming new natural DNA sequences.<sup>113</sup> DNA questions concerning sections 102 or 103 are thus difficult to answer. Secrecy and rapid development of programs have made it difficult to determine if a claimed program is novel and non-obvious.

## IX. CONCLUSION

A computer program per se claim is patentable subject matter unless the claim falls within a judicially determined exception as shown by court decisions, patents issued by the PTO, and PTO classification definitions. A mathematical algorithm is a judicially determined exception, consequently a mathematical algorithm program per se is unpatentable because it fails to meet the statutory subject matter requirement of title 35, section 101 of the U.S. Code. However, application of a mathematical algorithm program to statutory subject matter may result in patentable subject matter depending on the type of interaction with the statutory subject matter. Court and PTO criteria used to determine whether a program claim is allowed under section 101 are uncertain due to lack of a clear distinction between an algorithm and a mathematical algorithm, and imprecise guidelines for ascertaining the conditions under which a mathematical algorithm claim constitutes statutory subject matter. Also, there is disagreement between the Federal Circuit and the PTO regarding the scope of a "means-plus-function" program claim. A new analytical scheme is proposed to more effectively predict whether a program claim is likely to meet the statutory subject matter condition. Use of the scheme will assist in drafting allowable program claims. The analytical method is not affected by the disagreement between the Federal Circuit and the PTO concerning claim scope.

---

113. *Id.*

## APPENDIX

## Prosecution Histories of Selected Program Patents

A. *Patent No. 5,007,101, Iwahashi, et al., inventors*

1. Application filed in Japan on 12/29/81.<sup>114</sup>
2. U.S. application (claiming the filing in Japan as the priority date) filed on 12/28/82.<sup>115</sup>
3. The examiner rejected the claim under 35 U.S.C. § 101.<sup>116</sup>
4. The applicant appealed to the PTO Board. The Board sustained the rejection on 5/24/88.<sup>117</sup>
5. The applicant then appealed to the Federal Circuit. The court reversed the Board's decision and allowed the claim on 11/7/89<sup>118</sup>.
6. The patent issued on 4/9/91.<sup>119</sup>

B. *Patent No. 4,706,212, Toma, inventor*

1. Application filed on 8/31/71.<sup>120</sup>
2. The Board rejected a number of claims under 35 U.S.C. § 101.<sup>121</sup>
3. The applicant appealed to the C.C.P.A. The court reversed the Board's rejection and allowed the claims on 5/18/78.<sup>122</sup>
4. The patent issued on 11/10/87.<sup>123</sup>

C. *Patent No. 4,398,249, Pardo, et al., inventors*

1. Application filed on 8/12/70.<sup>124</sup>
2. The examiner allowed all claims on 7/28/72, but did not issue a notice of allowance.<sup>125</sup>
3. PTO reopened the prosecution following the *Gottshalk v. Benson*<sup>126</sup> decision and rejected the claims, under 35 U.S.C. § 101.<sup>127</sup>
4. The Board sustained the rejection.<sup>128</sup>

---

114. U.S. Patent No. 5,007,101 at 1, Iwahashi, et al., inventors (Apr. 9, 1991).

115. *Id.*

116. *In re Iwahashi*, 888 F.2d 1370, 1371 (Fed. Cir. 1989).

117. *Id.*

118. *Id.* at 1375.

119. U.S. Patent No. 5,007,101 at 1, Iwahashi, et al., inventors (Apr. 9, 1991).

120. *In re Toma*, 575 F.2d 872, 873 n.1 (C.C.P.A. 1978).

121. *Id.* at 873-74.

122. *Id.* at 878.

123. U.S. Patent No. 4,706,212 at 1, Toma, inventor (Nov. 10, 1987).

124. *In re Pardo*, 684 F.2d 912, 914 (C.C.P.A. 1982).

125. *Id.*

126. 409 U.S. 63 (1972).

127. *In re Pardo*, 684 F.2d 912.

128. *Id.*

5. The applicant appealed to the C.C.P.A. which reversed the Board's rejection, the claims were allowed on 8/5/82.<sup>129</sup>
6. The patent issued on 8/9/83.<sup>130</sup>

D. *Patent No. 4,344,142, Diehr, et al., inventors*

1. Application filed on 8/6/75, as a continuation of an abandoned application filed 5/23/74, which was a continuation-in-part of an abandoned application dated 9/26/73.<sup>131</sup>
2. The claims were rejected by the examiner, pursuant to 35 U.S.C. § 101.<sup>132</sup>
3. The applicant appealed to the Board. The Board sustained the rejection.<sup>133</sup>
4. The applicant then appealed to the C.C.P.A. The court reversed the rejection and allowed the claims on 8/9/79.<sup>134</sup>
5. The PTO requested a rehearing by the C.C.P.A. which was denied on 10/19/79.<sup>135</sup>
6. The Commissioner of Patents and Trademarks appealed to the Supreme Court. The court affirmed the C.C.P.A. judgment and allowed the claims on 3/3/81.<sup>136</sup>
7. The patent issued on 8/10/82.<sup>137</sup>

E. *Patent No. 4,195,338, Freeman, inventor*

1. Application filed on 5/6/70.<sup>138</sup>
2. The examiner rejected the claims under 35 U.S.C. § 101.<sup>139</sup>
3. The Board affirmed the rejection.<sup>140</sup>
4. The applicant appealed to the C.C.P.A. The court reversed the board's judgment and allowed the claims on 3/30/78.<sup>141</sup>
5. The patent issued on 3/25/80.<sup>142</sup>

---

129. *Id.* at 917.

130. U.S. Patent No. 4,398,249 at 1, Pardo, et al., inventors (Aug. 9, 1983).

131. Application of James R. Diehr, 602 F.2d 982, 983, n.1 (C.C.P.A. 1979).

132. *Id.* at 983.

133. *Id.*

134. *Id.* at 989.

135. *Id.* at 982.

136. *Diamond v. Diehr*, 450 U.S. 175, 193 (1981).

137. U.S. Patent No. 4,344,142 at 1, Diehr, et al., inventors (Aug. 10, 1982).

138. *In re Freeman*, 573 F.2d 1237, 1238 (1978).

139. *Id.*

140. *Id.*

141. *Id.* at 1247.

142. U.S. Patent No. 4,195,338 at 1, Freeman, inventor (Mar. 25, 1980).



